OWNER'S MANUAL

PROGRAMMER'S HEX & TIME CALCULATOR

PLEASE READ BEFORE USING THIS EQUIPMENT

EC-4075

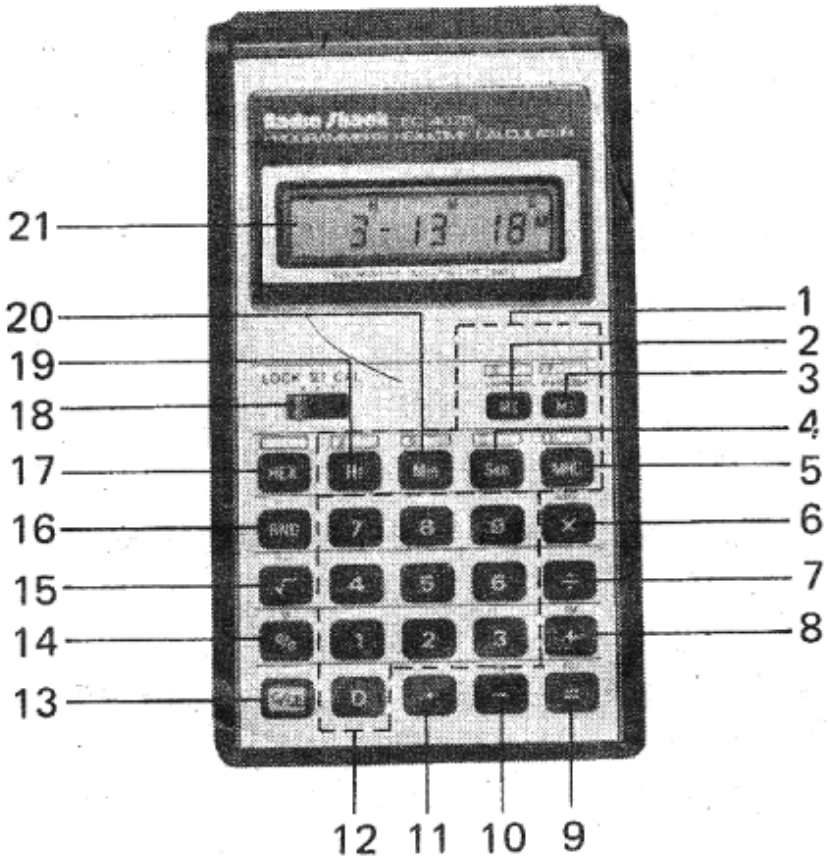
CAT.No. 65-990

Radio Shack®

TABLE OF CONTENTS

CONTROL LOCATIONS 4
POWER SOURCE 5
KEYS AND SWITCHES 5
DISPLAY 9
OVERFLOW 13
THE CLOCK 14
HOW TO SET TIME AND DATE 14
HOW TO SET ALARM TIME 15
HOW TO SET THE ON-THE-HOUR CHIME 16
HOW TO USE THE STOP-WATCH 17
HOW TO USE THE COUNT-DOWN TIMER 19
HOW TO END THE STOP-WATCH AND COUNT-DOWN TIMER FUNCTION . . . 19
TIME CONVERSION 20
HEXADECIMAL CONVERSION 20
RANDOM NUMBER 21
CALCULATION EXAMPLES 22
CARE AND MAINTENANCE 27
SPECIFICATIONS 28

CONTROL LOCATIONS



1. Hexadecimal Keys
2. Memory Minus/LAP/RESET Key
3. Memory Plus/START/STOP Key
4. Second Key
5. Memory Recall/Clear Key
6. Multiplication/DATE Set Key
7. Division Key
8. Addition/TiMe Set Key
9. Equal/Second ADJust Key
10. Subtraction/PM Key
11. Decimal Point Key
12. Numerical Keys
13. Clear/Clear Entry Key
14. Percent/On-the-Hour Key
15. Square Root/Alarm Key
16. RaNDom Number Key
17. HEXadecimal Mode Key
18. Mode Select Switch
19. Hour Key
20. Minute Key
21. Display

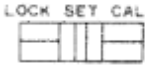
POWER SOURCE

You will need two AA batteries to operate your unit. We recommend Radio Shack's Enercell (Cat. No. 23-468 or Cat. No. 23-582) or alkaline batteries (Cat. No. 23-552).

1. Open the battery compartment cover on the back of the unit.
2. Install two AA batteries, observing proper polarity.
3. Close the battery compartment cover.

When the display gets dim, the batteries are weak and must be replaced. Never leave weak or dead batteries in your unit, "leak-proof" batteries may leak chemicals that will damage your calculator.

KEYS AND SWITCHES



Mode Select Switch

Set to LOCK when you are not using the calculating or stopwatch/timer functions. Slide to SET when you want to set the clock/calendar or use the stopwatch or timer functions. The CAL position is for normal calculation, including time and hexadecimal calculations.

General Keys

[0]~[9] [·] Data Entry Keys

Press these keys to enter numerical values into the calculator.

[+] [−] [×] [÷] [=] Basic Calculation Keys

Press these keys for addition, subtraction, multiplication, division, and to display answers.

[C/CE] Clear/Clear Entry Key

Press once to clear wrong entries. Press twice to clear everything except memory.

Memory Keys

[MRC] Memory Recall/Clear Key

Press once to display the contents of memory. Press twice to clear the memory.

[M+] [M−] Memory Plus and Memory Minus Key

Press [M+] to add the displayed number or total to memory. Press [M−] to subtract the displayed number or total from memory.

Function Keys

[%] Percent Key

To calculate the percent of the displayed number, enter the operation key, correct number for percentage, and [%].

[√] Square Root Key

Press to find the square root of the displayed number.

RND RaNDom Number Key

Press to generate a random number between 0 and 9 (0 and F in hexadecimal mode).

Press as many times as required to obtain the necessary number of digits.

Hexadecimal Calculation Keys

HEX HEXadecimal Mode Conversion Key

Press to turn to hexadecimal or decimal mode. In hex mode, HEX will appear on the display.

A Hr B Min HEXadecimal Numeral Keys

C Sec D MRC Allow hex number input in hexadecimal mode.

E M= F M±

Time Calculation Keys

Hr Min Time Entry Keys

Sec Press appropriate key to enter the time for time conversion or time calculation.

Clock Operation Keys (activated in the SET position)

TM + TiMe Set Key

Press to set the time.

DATE
[×] **DATE Set Key**

Press to set the date.

PM
[−] **PM Key**

Press to set to PM.

ADJ
[=] **Seconds ADJust Key**

Press to adjust the seconds to 00 (or any reading when pressed after number entry).

[%] **On-the-Hour Key**

Turns on/off the on-the-hour chime.

((•))
[√] **Alarm Key**

Press to set the alarm time. Also it turns alarm function on/off when pressed without number entry.

Stopwatch/Timer Keys (activated in the SET position)

START/STOP
[M+] **Start/Stop Key**

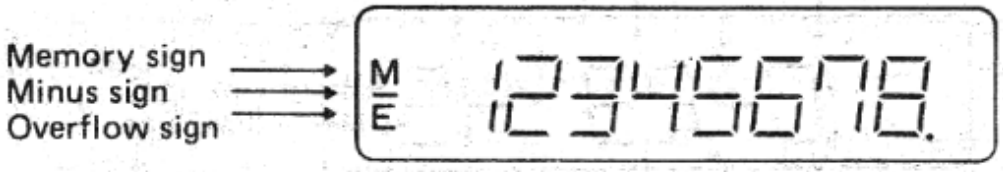
Press to activate the stopwatch or timer function. Press again to stop the time counting.

LAP/RESET
[M-] **Lap/Reset Key**

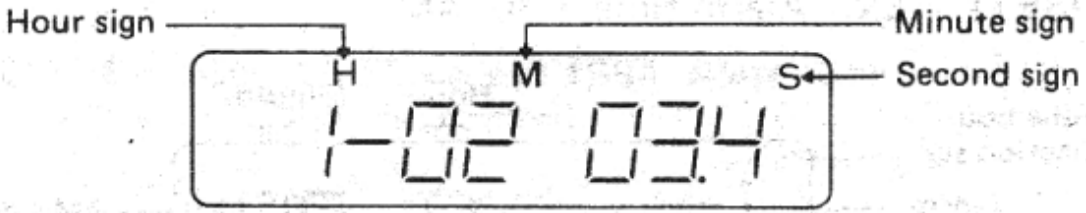
Press to read the lap time. Also, pressing this key resets the time count to 00 when STP is on the display.

DISPLAY

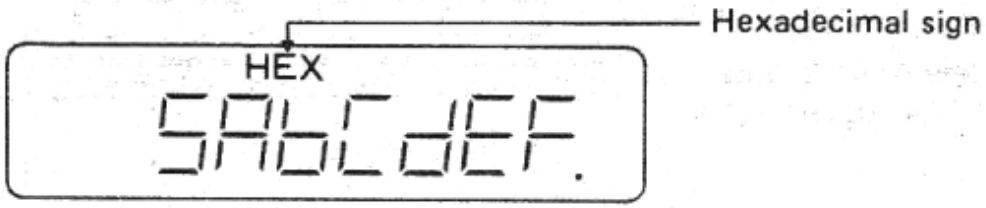
• Calculation mode (CAL)



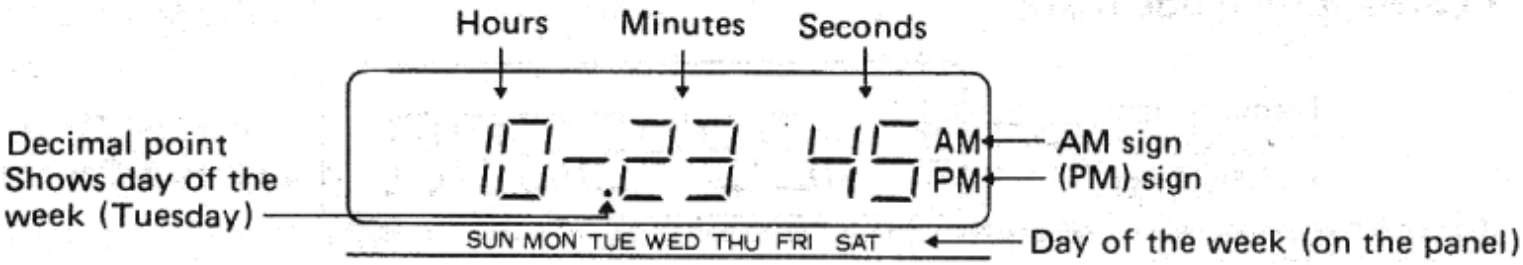
• Time conversion/Time calculation (CAL) Ex. 1 hr. 2 min. 3. 4 sec.



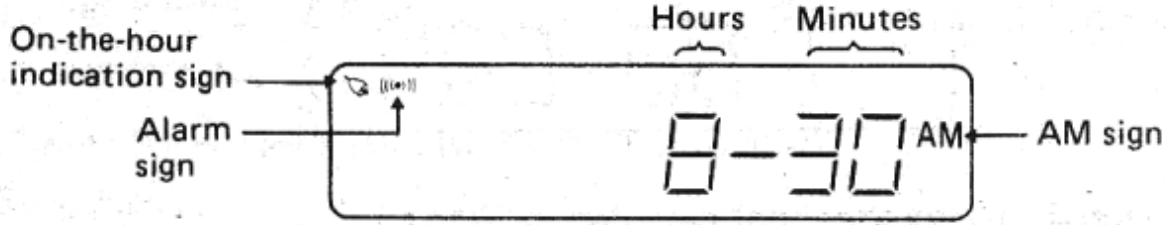
• Hexadecimal conversion/Hexadecimal calculation (CAL)



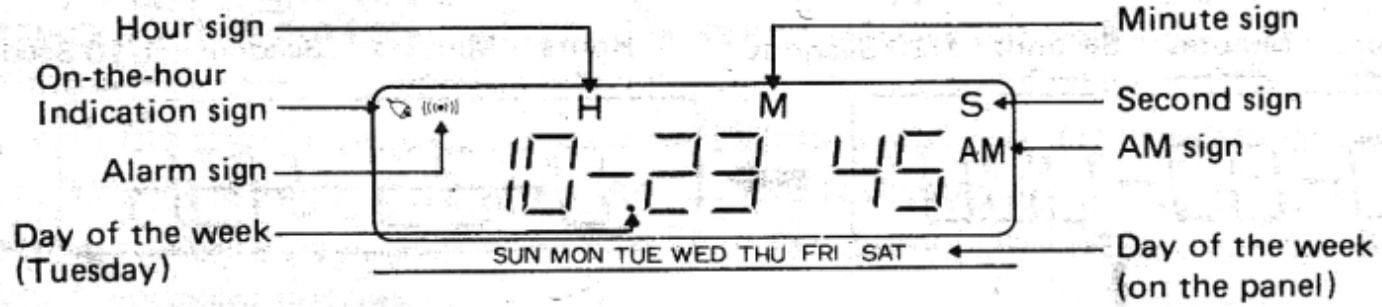
• Clock mode (SET) Ex. Tuesday 10:23'45" AM (PM)



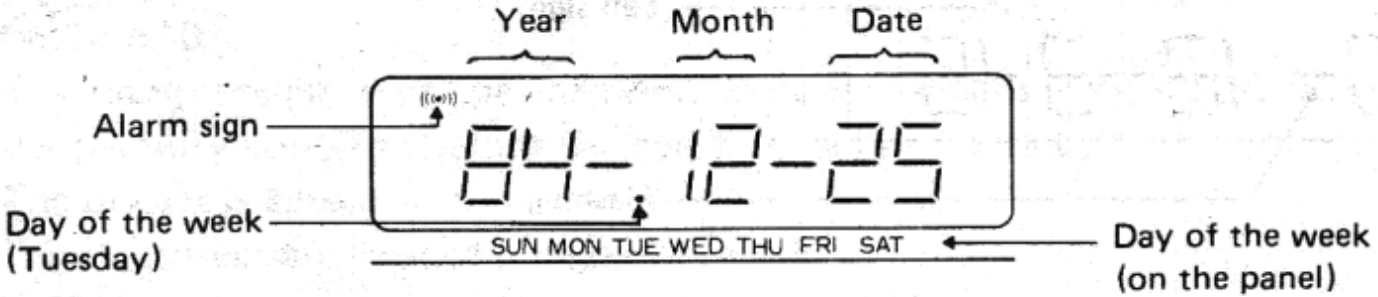
• Alarm time (SET) Ex. Alarm time 8:30' AM



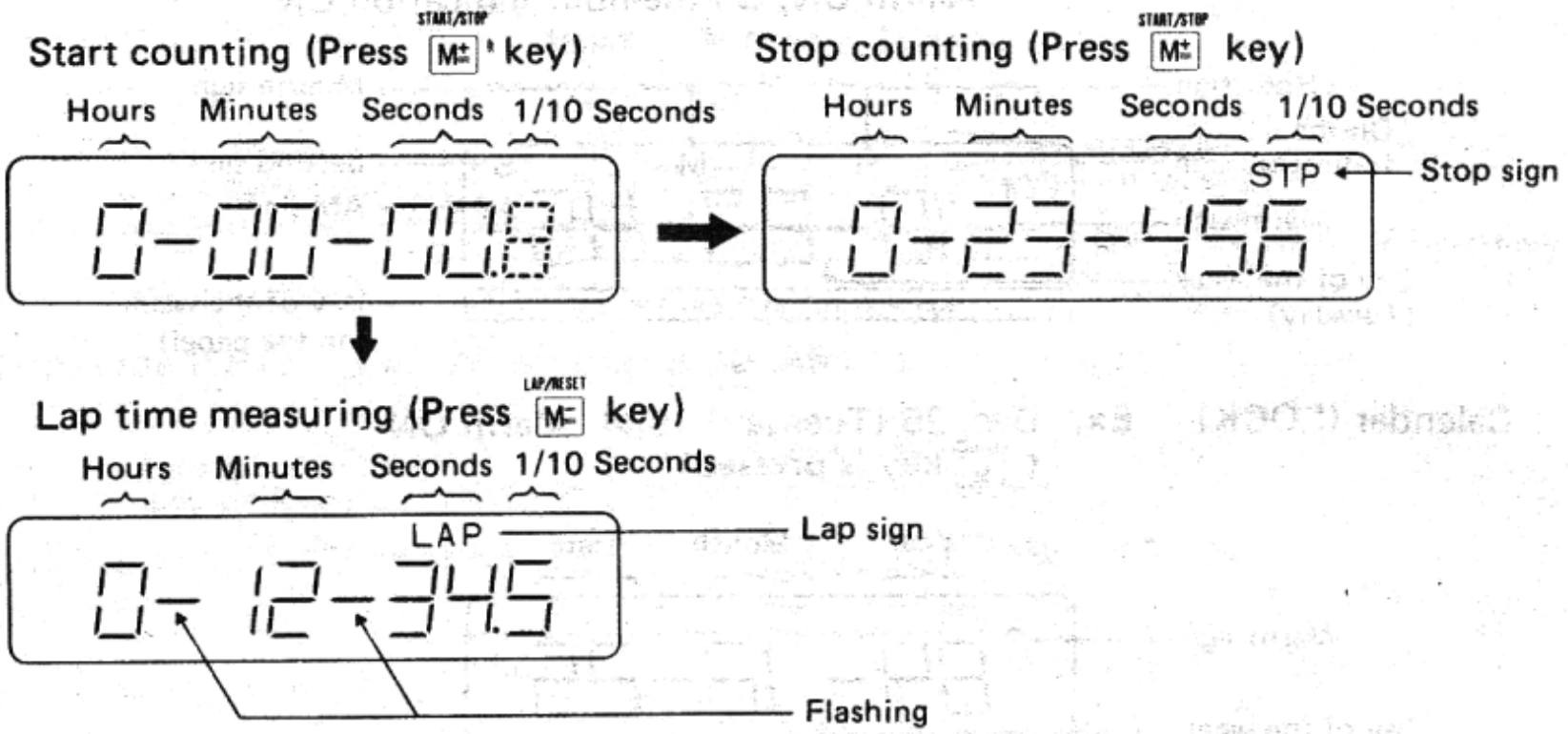
• Clock mode (LOCK) Ex. Tuesday AM 10:23'45"
Alarm ON, On-the-hour indication ON



• Calendar (LOCK) Ex. Dec. 25 (Tuesday) 1984, Alarm ON
(DATE key is pressed)



• Stop-Watch with Lap time function (SET)



OVERFLOW

Under the following conditions, the unit overflows (overflow sign (E) lights) then all keys except [C/CE] key are locked. Press [C/CE] key to release the lock.

- Clock mode
  1. Setting the regular time or alarm over 24 hours and over 60 minutes or seconds. (The hour limit will be 12 when the [PM −] key is pressed.)
  2. Setting the date beyond the built-in calendar dates (Jan. 1 1901 to Dec. 31 2099).
  3. Other incorrect entries.
- Calculation mode
  1. The integer portion of the calculation result exceeds eight digits. This result is shown in the upper eight digits, and approximate answer is product of displayed figure $X10^8$.
  2. The integer portion of the memory contents exceeds eight digits. If this happens, the memory contents before the overflow are protected.
  3. The divisor is zero.
  4. Taking the square root of a negative figure.
  5. Taking the square root of the time and hexadecimal.
  6. Performing addition or subtraction between time data and decimal numbers (including memory operation).

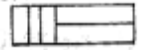
7. When performing the division of a decimal number divided by the time data.
8. Entering 27777.778 or more hours and 1666666.7 or more minutes. (i.e. over 99999999 seconds)
9. Entering 60 or more minutes after hour is entered.
10. Entering 60 or more seconds after hours or minutes are entered.

THE CLOCK

HOW TO SET TIME AND DATE

Ex. To set Dec. 25 (Tuesday) 1984 10:23'45" PM (22:23'45").

STEP	OPERATION	DISPLAY
1. Position the Mode select switch to SET.	LOCK SET CAL C/CE	0000
2. Enter hour and minute: if necessary, set PM simultaneously. Press TM (+). } Time	1023 PM (−) TM (+) or 2223 TM (+)	10-23 00 PM
3. Enter second and press ADJ (=). } Time	45 ADJ (=)	10-23 45 PM
4. Enter year (1901 ~ 2099) and press DATE (×).	1984 DATE (×)	84- 0000

5. Enter month (1 ~ 12) and date (01 ~ 31) and press DATE ⊠. } Date	1225 DATE ⊠	84-.12-25 SUN MON TUE WED THU FRI SAT
6. Shift the Mode select switch to LOCK to keep the time on the display.	LOCK SET CAL 	H M S 10-.23 55 PM

* In the SET mode, up to 4 digits can be entered. If more than 4 digits are entered, only the last 4 digits will be displayed.
* When TM (+) key is pressed, the seconds begin counting from 00.
* If the ADJ (=) key is pressed without numeral entry in the SET mode, the seconds are set to 00. 00 to 29 seconds are rounded off to 00 seconds, and 30 to 59 seconds are rounded off to the nearest minute, the minute display advances one.
* For setting the date, only an actual date between 1901 and 2099 can be entered. (For example, you cannot enter Feb. 29, 1985.)

HOW TO SET ALARM TIME

Ex. Alarm setting at 1:23'00" PM.

STEP	OPERATION	DISPLAY
1. Position the Mode select switch to SET. 2. Enter hours and minutes, if necessary, set PM simultaneously. 3. Press the √ key. 4. Slide the Mode select switch to LOCK to keep the time on display.	LOCK SET CAL C/CE PM 123 − or 1323 √ LOCK SET CAL	0000 0:123PM 1-23PM

* Do not press PM − for setting time to AM.
* To recall the preset alarm time, press √ with the Mode switch in SET position.
* For clearing the alarm, press √ while the alarm time is displayed. To re-set alarm, press √ again.
* The alarm rings for one minute at the preset time.
* Press C/CE to stop the alarm while it rings (if Mode select switch is in LOCK position).

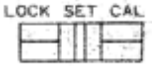
HOW TO SET THE ON-THE-HOUR CHIME

To activate the on-the-hour chime, press % with the Mode select switch at SET. The on-the-hour indication sign lights. To turn off the function, press % again.

HOW TO USE THE STOP-WATCH

During the stop-watch function, all keys except LAP/RESET M−, START/STOP M±, and C/CE becomes inoperative.

Ex. Measure the time for a 100 meter dash (Standard time measurement).

STEP	OPERATION	DISPLAY
1. Position the Mode select switch to SET. 2. Press START/STOP M± . (Start) 3. Press START/STOP M± . (Finish) 4. Press LAP/RESET M− . (Clears stop-time and prepares for next time)	 C/CE START/STOP M± START/STOP M± LAP/RESET M−	0000 0-00-00.0 0-00-12.3 STP 0-00-00.0

Ex. Keeping time for a soccer game (Accumulated time measurement).

STEP	OPERATION	DISPLAY
1. Press START/STOP M± . (Kick off) 2. Press START/STOP M± . (Time-out or intermission) 3. Press START/STOP M± . (Game resumed) 4. Press START/STOP M± .	START/STOP M± START/STOP M± START/STOP M± START/STOP M±	0-00-00.0 0-45-00.3 STP 0-45-00.0 1-30-00.0 STP

Ex. Measure the time at every 500 meters in a 1500 meter race (Lap time measurement).

STEP	OPERATION	DISPLAY
1. Position the Mode select switch to SET. 2. Press START/STOP M± . (Start) 3. Press LAP/RESET M± . (Lap time at 500 meters.) 4. Press LAP/RESET M± . (Continue) 5. Press LAP/RESET M± . (Lap time at 1000 meters.) 6. Press LAP/RESET M± . (Continue) 7. Press START/STOP M± . (Time at Finish.)	 C/CE START/STOP M± LAP/RESET M± LAP/RESET M± LAP/RESET M± LAP/RESET M± START/STOP M±	0000 0-00-00.0 LAP 0-01-23.5 0-01-23.6 LAP 0-02-51.3 0-02-51.8 STP 0-04-20.3

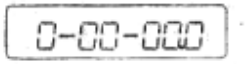
* In the stop-watch function, if the time measurement continues over 9 hrs. 59 min. 59.9 sec., the time counter on the display will start from 00.0 seconds.

HOW TO USE THE COUNT-DOWN TIMER

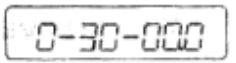
Ex. The remaining time counted down in a basketball game.
A given time is 30 minutes for a half of the game.

STEP	OPERATION	DISPLAY
1. Position the Mode select switch to SET, and press C/CE . 2. Enter minutes and seconds. 3. Press START/STOP M± .	LOCK SET CAL C/CE 3000 START/STOP M±	0000 3000 0-29-59.3

* When the remaining time is 00.0 seconds, the alarm will sounds for 8 seconds. (See Fig. 1)

Fig. 1 

* The count-down operation can be repeated by pressing START/STOP M±, the original set time is displayed after the beep tone ends. (See Fig. 2)

Fig. 2 

HOW TO END THE STOP-WATCH AND COUNT-DOWN TIMER FUNCTION

1. Press LAP/RESET M− or C/CE when the stop sign (STP) is lit on the display.
2. Press LAP/RESET M− successively when the stop sign (STP) and Lap sign (LAP) are lit at the same time on the display.
3. Shift the Mode select switch to the LOCK or CAL position.

TIME CONVERSION

Ex. How many seconds (how many minutes) are there in 5 hours 55 minutes?

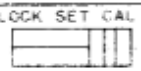
STEP	OPERATION	DISPLAY
1. Position the Mode select switch to CAL.	LOCK SET CAL, C/CE	0
2. Enter hours.	5 Hr	05H 00
3. Enter minutes.	55 Min	05H 55M 00
4. Press ADJ = or Sec .	ADJ =	5H 55M 00S
5. Press Min . (How many minutes?)	Min	355M
6. Press Sec . (How many seconds?)	Sec	21300S

* In time conversion or time calculation, a maximum of 99999999 seconds can be entered.
(i.e. 27777,777 hours or 1666666.6 minutes)
(An Error occurs if larger figures than these are used.)

HEXADECIMAL CONVERSION

To convert a decimal number to a hexadecimal number or vice versa.

Ex. What hexadecimal number equals 99999999 in decimals?

STEP	OPERATION	DISPLAY
1. Position the Mode select switch to CAL.	 C/CE	0.
2. Enter the decimal number.	99999999	99999999
3. Press HEX (in hexadecimal).	HEX	HEX 5F5E0FF.
4. Press HEX (in decimal).	HEX	99999999

* In the hexadecimal conversion, 5F5E0FF in hexadecimal (= 99999999 in decimal) is maximum.
* For fractions, only the integer portion is used in hexadecimal mode. Time display cannot be converted.

RANDOM NUMBER

Press RND , to generate a random number between 0 and 9.
(In hexadecimal mode, a random number between 0 and F will appear on the display.)
Press RND as many times as necessary to obtain required number of digits.
The maximum random number you can obtain is the display limit: i.e. 99999999 decimal (5F5E0FF hex.).

CALCULATION EXAMPLES

Note: Set Mode select switch to CAL

Basic calculation

Examples	Operation	Display
$(12-23)\times 3\div 4=-8.25$	12 [−] 23 [×] 3 [÷] 4 [=]	− 8.25

Constant calculation

$9\times 8=72$	9 [×] 8 [=]	72.
$9\times 3=27$	3 [=]	27.
$8\div 2=4$	8 [÷] 2 [=]	4.
$6\div 2=3$	6 [=]	3.

Power calculation

$2^2=4$	2 [×] [=]	4.
$2^{-2}=0.25$	2 [÷] [=] [=]	0.25

Repeat calculation

Examples	Operation	Display
$35 \div 2 \div 2 = 8.75$	35 [÷] 2 [=] [=]	8.75

Reciprocal calculation

$\frac{5}{2 \times 3 + 4} = 0.5$	2 [×] 3 [+] 4 [÷] [=] 5 [=]	0.5

Percentage calculation

1) 5% of \$120 is \$6	120 [×] 5 [%]	6.
2) \$50 profit of 200 list price corresponds to profit rate of 25%	50 [÷] 200 [%]	25.

Add-on/Discount calculation

1) 30% add-on to \$500 is \$650.	500 [×] 30 [%] [+] [=] (500 [+] 30 [%])	650.
2) 20% discount from \$500 is \$400.	500 [×] 20 [%] [−] [=] (500 [−] 20 [%])	400.

Memory calculation

Examples	Operation	Display
$10 \times 50 = 500$ ·····(S_1)	MRC MRC 10 × 50 M+	M 500.
$35 \times 40 = 1400$ ·····(S_2)	35 × 40 M−	M 1400.
$40 \times 120 = 4800$·····(S_3)	40 × 120 M+	M 4800.
$(S_1) - (S_2) + (S_3) = 3900$	MRC MRC	3900.

Square root

$\sqrt{3}$	3 √	1.7320508
$\sqrt{(1+2) \times 3}$	1 + 2 × 3 = √	3.

Time calculation

1) (12H25M30S) + (22H40M53S) =	C/CE 12 Hr 25 Min 30 Sec +	12H 25M 30S
35H6M23S	22 Hr 40 Min 53 Sec =	35H 06M 23S
2) (6H40M) ÷ (1H20M) = 5	C/CE 6 Hr 40 Min ÷ 1 Hr 20 Min =	5.
3) (14H46M20S) ÷ 2 = 7H23M10S	C/CE 14 Hr 46 Min 20 Sec ÷ 2 =	7H 23M 10S

Note: The constant and memory calculations can be used for the time calculation.

Hexadecimal calculation

Examples	Operation	Display
1) 456(HEX) − 123(HEX) + 789(HEX) = ABC(HEX) (1110 − 291 + 1929 = 2748)	HEX 456 − 123 + 789 = HEX	HEX ABC. 2748.
2) C0(HEX) + 32 = 224 = E0(HEX)	C HEX Sec 0 HEX + 32 = HEX	224. HEX E0.
3) AB(HEX) × CD(HEX) = 88EF(HEX) = 35055	A B C D HEX Hr Min × Sec MRC = HEX	HEX 88EF. 35055.
4) 898EA5(HEX) ÷ AB(HEX) = CDEF(HEX)	E A A B HEX 898 M= Hr 5 ÷ Hr Min =	HEX CdEF.
5) E1(HEX) × 20%(HEX) = 48(HEX) = 72	E HEX M= 1 × 20 % HEX	HEX 48. 72.

Note: The constant and percentage calculations are possible for hexadecimal calculation.

Correction incorrect entries

Examples	Operation	Display
123+456=579	C/CE 123 + 455 C/CE 456 =	579.
7×8=56	C/CE 7 ÷ × 8 =	56.

Note: To correct a mis-entered +, −, × or ÷ key, press the correct key immediately after mis-operated key.

CARE AND MAINTENANCE

1. Because this clock/calculator is a delicate, precise instrument, observe the following instructions for trouble-free performance.
   a) Avoid sudden temperature change (Working temperature range: 0°C ~ 40°C, 32°F ~ 104°F).
   b) Do not leave it in a hot place (such as in a closed car exposed to direct sunlight, near a stove, etc.).
   c) Avoid moisture, dust, direct sunlight, and hard impacts.
2. To wipe the surface, use a soft cloth. Do not use volatile chemicals or a damp cloth.
3. It is an LCD characteristic that the display response is slower at low temperatures. It does not affect the calculating function.
4. Do not disassemble this unit.
5. Operation may become impossible because of static electricity. To clear the calculator, take out the batteries and re-install them.

SPECIFICATIONS

CLOCK

Display	Date (Year, Month, Day and Day of the week) → (Jan. 1 1901 ~ Dec. 31 2099) Time (Hour, Minute, Second) Sign (Hour, Minute, Second, AM/PM, Alarm, On-the-hour indication)
Accuracy	±2 Seconds/day (at 25°C)
Alarm	Electronic buzzer
Time adjustment	Numeric key and special use of adjustment key.

STOPWATCH

Display	Hour, Minute, Second, 1/10 Second, Stop sign (STP), Lap sign (LAP)
Measurement function	Standard time, Accumulated time, Lap time and Count-down timer
Measuring unit	1/10 Second

Measuring range	Stop watch: Continuous 00.0 seconds to 9 hours 59 minutes and 59.9 seconds. Count-down timer: Continuous max. 99 minutes 99 seconds to 00.0 seconds.

CALCULATOR

Display	8 digits with zero suppression, M, −, E and HEX sign Time calculation: Hour sign (H), Minute sign (M), Second sign (S)
Decimal point system	Full floating system with underflow system.
Capacity	Normal calculation: 8 digits for input and result. Hexadecimal calculation: max. 5F5E0FF Time calculation: max. 99999999 seconds = 1666666.6 minutes = 27777.777 hours for input and result.
Functions	Basic calculation (+, −, x, ÷), constant, power, reciprocal, repeat, percentage, add-on/discount, memory, extraction of square roots, time conversion, time, hexadecimal conversion, hexadecimal and other mixed calculations.

COMMON PARTS

Display	Liquid crystal display
Principal element	LSI, Crystal oscillator (32.768kHz)
Working temp.	0°C ~ 40°C (32°F ~ 104°F)
Power source	Two AA size batteries Battery life: Approx. 10,000 hours (at 25°C)
Power consumption	0.00005W (typ.), 0.0025W (max.)
Dimensions	74(W) x 130(D) x 27(H)mm
Weight	91g